

REMARKS

Claims 1 - 47 are pending in the application. Claims 1 - 47 stand rejected by the Examiner. Reconsideration of the application in view of the above amendments and arguments below is respectfully requested. The Examiner's rejections are addressed in substantially the same order as in the referenced office action.

Cited Art

Butler ('275)

The Butler '275 reference relates to a directional transducer, which includes flexural disc transducer elements mounted by their periphery to an inertial mass and connected to a transducer housing at the centers of the transducer elements.

The housing 12 is described as being generally made of plastic material, the inertial mass 14 is described as being made of sintered tungsten, lead or brass, the flexural discs 20,22 are described as brass and is attached to the inertial mass by plastic rings 16, 18. Ceramic piezoelectric disc elements 24,26 are mounted on the flexural discs 20,22.

The '275 reference does not discuss insulating two conductive elements by coating the surface of at least one of the elements. The '275 reference does not suggest a geophone coil/magnet arrangement.

Marschall ('562)

The Marschall '562 reference relates to a hydrophone array having a cable including acoustic transducers. Each transducer 11 comprises a cylindrical strain shielding element 14 and a cylinder

of piezoelectric material 15 arranged to be operated in hydrostatic mode. The strain shielding element 14 is made of a stiff material such as carbon fiber and acts to substantially shield the piezoelectric material 15 from stresses generated in the cable 12 during use.

The piezoelectric material 15 is described as polyvinylidene fluoride (PVDF) film which has been wrapped around the outer surface of the strain shielding element 14 a plurality of times. The film is metallized on each surface with a further top layer of insulating material on each side ensuring no electrical short circuits between the two surfaces when it is wrapped around the strain shielding element 14. The outer wrap of insulating material, for example Mylar, may be metallised to provide an electrostatic shield for the hydrophone. Leads (not depicted) from the respective surfaces of the PVDF film 15 can be connected to signal conditioning electronics which is in turn interconnected to data bearers (not depicted) present in the cable 12 which allow transmission of signals generated by the PVDF to standard data analysis equipment known in the art located on a survey vessel towing the cable 12.

The '562 reference does not suggest a geophone coil/magnet arrangement. The Mylar coating is the only non-conductive coating discussed and there is no mention of nonconductive paint, nonconductive adhesive, an enamel layer, an oxidized layer, or an anodized layer applied to or disposed on two or more conductive components in a housing.

Hall Jr. ('464)

The '464 reference relates to an improvement over a conventional electromagnetic geophone. The improvement being in mounting on the bobbin, a vernier mechanical damping mass made of a

coil of insulated wire. The coil is open-ended and the mechanical damping force is adjustable in accordance with the number of turns in the coil.

A mass-coil assembly includes a unitary, generally-cylindrical bobbin having a thin wall provided with four radially-extending shoulders 18a-d defining two outer cradles 18a', 18c', and a center cradle 18b'. Cradles 18a', 18c' accommodate two induction coils 16, 16' connected in series. Each coil has a plurality of turns of fine insulated wire. *The body of bobbin 14 is made from a suitable plastic material.*

The stationary, magnet assembly 13 includes a hollow, outer cylinder 32 which is closed at the top and bottom *by insulating cover plates 34-34'*. In addition to rendering the inner volume 36 of case 32 fluid tight, plates 34-34' serve as support and centering elements as well.

The '464 reference does not discuss a double-ended geophone and does not discuss an insulated conductive path arrangement from one end of a geophone housing to another.

McNeel ('692)

The McNeel '692 reference teaches a magnetic assembly 36 that is located within a hollowed out central area 50 of a coil form 48 which is insulated from a top assembly *"solely by means of an insulating washer 80."* Similarly, '445 teaches that insulating discs 121 and 116, described as punched polyester, are separators inserted between conductive components as shown in Figure 1. In each cited reference there only appears to be the use of insulating material in the form of a washer or disc to insulate conductive components.

The '692 references does not discuss a double-ended geophone arrangement and does not discuss an insulated conductive path arrangement from one end of a geophone housing to another. The '692 references does not mention the possibility of using a treated surface to insulate components.

35 USC § 102 REJECTIONS

Claims 31 and 46 stand rejected under 35 USC § 102(b) as being anticipated by Butler ('275). The amendment submitted herewith cancels these rejected claims.

35 USC § 103 REJECTIONS

Claims 18, 19, 44, 45 and 47 stand rejected under 35 USC § 103(a) as being unpatentable over Marschall et al. ('562).

Independent claim 18 is cancelled.

Dependent claim 19 is rewritten in independent form. The claim requires treating a surface of at a first component or a second components to render at least a portion of the treated surface electrically non-conductive, wherein the treatment comprises disposing at least one of (i) nonconductive paint, (ii) nonconductive adhesive, (iii) an enamel layer, (iv) an oxidized layer, and (v) an anodized layer, on the surface.

Independent claim 44 is written to a geophone and requires a plurality of first electrically conductive parts and a plurality of second electrically conductive parts, the first plurality of parts being interconnected to form an electrically conductive pathway, the electrically conductive pathway

being insulated from the second plurality of parts by an electrically insulating layer disposed between the electrically conductive pathway and the second plurality of parts.

Dependent claim 45 adds to claim 44 particular insulating layer limitations as seen in claim 19 above.

Independent claim 47 is cancelled.

As to claims 19 and 45, Marschall does not teach or suggest treating a surface of at a first component or a second components to render at least a portion of the treated surface electrically non-conductive, wherein the treatment comprises disposing at least one of (i) nonconductive paint, (ii) nonconductive adhesive, (iii) an enamel layer, (iv) an oxidized layer, and (v) an anodized layer, on the surface.

As to claims 44 and 45, Marschall mentions nothing about a plurality of first electrically conductive parts and a plurality of second electrically conductive parts, **the first plurality of parts being interconnected to form an electrically conductive pathway, the electrically conductive pathway being insulated from the second plurality of parts** by an electrically insulating layer disposed between the electrically conductive pathway and the second plurality of parts.

Marschall only teaches treating a flexible conductive surface with Mylar to allow the conductive surface to be rolled about a strain-shielding element a plurality of times. Applicant respectfully submits that the instant claims are not directed to the general concept of insulating components, but to insulating components in a geophone assembly. The present application notes the limitations of the conventional geophone at page 3.

“In geophones, both ends of the electrical path have to be electrically insulated from each other and the outside case of the geophone. Typical conventional geophones satisfy this requirement by using insulation sleeves, insulation disks, and other similar devices. Such devices complicate the assembly of the geophone.”

The Examiner concludes that it would have been obvious to one of ordinary skill in the art to apply the insulating method of Marschall to a geophone, because the hydrophone of Marschall is an acoustic transducer and a geophone is an acoustic transducer.

In putting the statutory language of 35 U.S.C. §103(a). to practice, the MPEP states:

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. *Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure.* (emphasis added)

MPEP §706.02(j) Contents of a 35 U.S.C. 103 Rejection, (citing) In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applicant respectfully submits that Marschall does not teach or suggest each and every element and does not suggest all of the elements as arranged in the rejected claims. Furthermore, no combination of references suggests the particular coatings or the use of pluralities of insulated conductive parts to create a conductive pathway in a geophone. Applicant would also draw the Examiner's attention to the following:

When patentability turns on the question of obviousness, the search for and analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to

select and combine the references relied on as evidence of obviousness.

In re Lee, 61 USPQ2d 1430,1433 (Fed. Cir. 2002), *citing* McGinley v. Franklin Sports, Inc., 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001) ("the central question is whether there is reason to combine [the] references," a question of fact drawing on the Graham factors).

Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references.

In re Dembiczak, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999).

Applicant respectfully submits that the Examiner has not made a prima facie case of obviousness, because the Marschall reference does not suggest all of the elements the claimed invention and no combination of the art of record teaches all of the claimed element as arranged in claims 19, 44 and 45.

Claims 1-17, and 20-43 and 47 stand rejected under 35 USC § 103(a) as being unpatentable over Hall Jr. ('464) or McNeel ('692) in view of Butler ('275).

Rejected claims 12, 31-43 and 47 are canceled.

Independent claims 1, 11 and 20 are amended. Dependent claim 30 is amended to reconcile the claim with the amendment to claim 20. The independent claims are amended to further limit the claims to include a plurality of conductive parts forming the conductive path and an insulating deposit on a surface of the plurality of parts, on the housing, on a surface of other conductive parts to insulate the conductive pathway. Support is found in the application, e.g., at page 21 line 12 through page 22 line 7.

The Examiner cites '464 and '692 as teaching a geophone with a housing, an electrically conductive terminal, a magnet and a coil resiliently all being exemplary of prior art geophones that

include a housing with first and second terminals. Butler is cited as teaching a transducer with terminals of opposite ends.

The amended independent claims now include a limitation as to the formation and insulation of a conductive pathway. The claims speak to a geophone, and the claimed invention has the stated advantages of “a geophone design that is simpler to manufacture and more resistant to mechanical shocks and vibration”, page 22 lines 21-22.

As discussed above with respect to the previous rejection, the proposed combination does not teach or suggest all of the claimed elements. The art of record does not teach or suggest a geophone that includes an electrically conductive path formed from a plurality of conductive parts where an electrically insulating deposit on a surface of the plurality of conductive parts electrically insulates the pathway from the housing as claimed in amended claim 1.

The art of record does not teach or suggest a geophone, wherein a first end plate support, a first resilient ring, a first spring, a first coil support and a first coil are electrically coupled to form a conductive path to the first end, the conductive path being insulated from other conductive parts by an insulating coating deposited on a surface of parts forming the conductive path or on a surface of the other conductive parts as claimed in amended claim 11.

The art of record does not teach or suggest a seismic data acquisition system that includes a geophone having a first coil resiliently mounted within a housing and operably coupled to a first terminal through a first plurality of conductive parts coupled to form a first conductive pathway, wherein the first conductive pathway is electrically insulated from the housing by a deposit of insulating material deposited on one of the housing and the first plurality of conductive parts, and a second coil resiliently mounted within the housing and operably coupled to a second terminal



through a second plurality of conductive parts coupled to form a first conductive pathway, wherein the second conductive pathway is electrically insulated from the housing by a deposit of insulating material deposited on one of the housing and the second plurality of conductive parts.

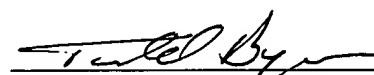
Applicant respectfully submits that rejected independent claims 1, 11 and 20, as amended, are not obvious in view of the proposed combination. Furthermore, Applicant submits that the remaining dependent claims referring to these amended independent claims are not obvious for at least the same reasons as stated for the respective independent claim.

CONCLUSION

For all of the foregoing reasons, applicant submits that the remaining claims are allowable over the prior art of record. A check in the amount of \$420 for an extension of time is enclosed with this response. The Commissioner is hereby authorized to charge any additional fee due for this response or credit any overpayment to Deposit Account No. 13-0010 (IO-1027-US).

Respectfully submitted,

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